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Notes on the Japanese Species of *Daphniphyllum*. (I).

By Isao HURUSAWA

古澤潔夫：日本産ゆづりは属ノ種類ニ就テ（其一）

Introductory Note

The genus *Daphniphyllum* was established by BLUME in 1825. (*Bijdr. Fl. Nedrl. Ind.* XVII, 1152.) It is based upon a single species, *Daphniphyllum glaucescens*, although the conception of his species covers two different forms, one of which J. MUELLER of AARGAU subsequently regarded as a distinct species, *Daphniphyllum Blumeanum* and J. J. SMITH as a variety of *D. glaucescens*. At first, BLUME attributed it to a sort of Rhamnaceæ, without giving exact systematic position, but as "genera Rhamnaceis affinia". (in op. cit.). This opinion has been accepted by MEISNER and ENDLICHER, the former author put it near *Zizyphus* with *Carpodetus*, *Sphaerocarya*, *Schaefferia* and *Gouphia*. (*Plantarum Vascularium Genera I*, 71. 1836.), and the latter author fixed the position of the genus as follows: Ordo Rhamnaceæ Tribus Pomaderreæ, Genera Rhamneis affinia. (*Gen. Pl.* 1104. n. 5755. 1840.)

In 1859, HENRI BAILLON (*Étud. gén. Euphorb.* 564.) commented, for the first time, on the affinity of this genus with the Euphorbiaceæ, and later (*Hist. Pl.* V, 252. 1874.), he classed it in Euphorbiaceæ Trib. Phyllantheæ. In *Journal of the Linnean Society XVII*, 216. (1880) and in *Genera Plantarum III*, 282. (1880) BENTHAM supported this view, referring it to the group of genera, *Aporosa*, *Baccaurea* (= *Pierardia ROXBURGH*) etc. He thought *Daphniphyllum* is nearest to *Baccaurea*.

Preceding to BAILLON, WIGHT (*Icon. Pl. Ind. Orient.* V, 22. cum t. 1877-78.

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1852.) put this genus in *Goughia* of the tribe Buxeeae of Euphorbiaceae, apparently overlooking BLUME's *Daphniphyllum*. His concept of "Buxeeae" is similar to that of "Phyllantheae" of other authors, still more broader. Contemporaneously with BAUILLON JOHANNES MUELLER established a new order of Daphniphyllaceae. However, this has been ignored for a long time, until KÖTHE ROSENTHAL recognized it in 1916. (Monogr. Gatt. *Daphniphyllum* in ENGLER, Pfl.-reich Ht. 68. IV, 147. a. 1. and Pfl.-fam. rev. ed. 19. c. 233. 1931.)

HALLIER's opinion to regard Daphniphylleae as a tribe of Hemamelidaceae is interesting but too far going. (in Bot. Mag. Tokyo XVIII, 55. 1904.) His idea based chiefly on the contiguous arrangement of leaves on the apex of a branchlet and the terminal inflorescence etc., is utterly groundless.

MUELLER's new family (in DC. Prodr. XVI-1, 1. 1869.) is valid so far, but the subdivision is too artificial. No section has been made and the species are arranged at random. Among them one African species, *D. africanum* MUELL. ARG., was later isolated by PIERRE (in Bull. Soc. Linn. Paris 1326. 1897.) as a monotypic genus *Plagiostyles*. This belongs not to the Daphniphyllaceae but to the tribe Phyllantheae of Euphorbiaceae.

The characteristics pointed out by MUELLER are (1) calyx of the female flower—deciduous or persistent; (2) the form of the anther—laterally compressed, dorsally compressed or tetragonal; (3) equivalently with (2), whether the surface of the fruit (the kernel) is tuberculate-asperate or flat.

ROSENTHAL, however, put the weight on the characteristics of the leaves, and he subdivided the genus by the leaves whether they are papillose or not on the undersurface. He did not give any sectional names for the different groups. Among the species which grow in our regions I discriminate two genetical races, one is represented by *Daphniphyllum macropodium*, and the other by *D. Teijsmanni*. In the former, the female flowers are beset of obvious staminodes often with the rudimentary anthers, but of obscure or no sepals. The male flowers have scaly, fugaceous sepals, and sometimes rudimental ovaries. The occurrence and the size of the rudimentary ovaries change by flowers in one inflorescence or in one tree. In the latter, there is very obscure or no trace of staminodes in the female flowers, but the sepals,

if they are large or small, persistent or deciduous, are always seen. The ovary (rudiment) in the male flower is not seen. The male flower has also a genuine calyx. Still more, the leaves of the former group are minutely reticulated, while those of the latter are more loosely and vaguely reticulated. Having such differences, these two groups deserve two distinct sections, and I should like to call them as (a) Staminodia and (b) Calycifera.

In my recent trip to the Island of Amami-Ōshima, I could find an interesting *Daphniphyllum* resembling to *D. Teijsmanni*, in which the fruits accompany free sepals and rudimentary staminodes (or petaloids?). In the note of *D. macropodum*, ROSENTHAL has written a supposed hybrid which was collected in the Island. This seems to coincide with my specimens. The real *D. macropodum* has never been found in the Island and also the nature of the leaves of my plant is that of *D. Teijsmanni* not being that of *D. macropodum*. From this fact I insist that no hybrid theory can hold for the Ōshima *Daphniphyllum* and that the supposed hybrid makes a distinct species, belonging to the latter section Calycifera.

The writer could make this study under the kind guidance and valuable advice of Prof. T. NAKAI, to whom he wishes here to express his cordial thanks.

Enumeration and Description

I. Sect. **Staminodia** HURUSAWA, sect. nov.

Flores mase. calycibus obsoletis cito delapsis praediti. (In *D. macropodo* in alabastro modo lepigeri.) Flores foeminei staminodiis nonnullis conspicuis interdum cum antheris rudimentariis apicalibus cincti; calyces sunt valde obsoletaee saepe carentes. (In *D. macropodo* interdum in floribus masculinis ovaria sterilia—rudimenta?—evoluta, quae sunt in gradu conspicuo primo intuitu quasi ovaria genuina.) Folia majora, plus minus sparsius nervosa, vel saltem nervis haud distinete elevatis.

'Typus *D. macropodum* (incl. *D. humile*). Praeterea, nondum vidimus autem, ex descriptione tatum fortasse etiam *D. celebense* atque *D. hymalense* hic adnumeranda.

Daphniphyllum macropodum MIQUEL in Ann. Mus. Bot. Ludg.-Batav.

III, 129.(1867) et Prolusio Fl. Jap. 293.(1867); MUELLER ARG. in DC. Prodr. XVI-1, 5.(1869) pro "species dubii loci"; FRANCHET et SAVATIER, Enum. Pl. Jap. I, 427.(1875) conceptus Franchetianus de his plantis interdum cum *D. Teijsmanni* intermisceatur; FORBES et HEMSLEY in Journ. Linn. Soc. XXVI, 429.(1894); DIELS in ENGLER's Bot. Jahrb. XXIX, 428.(1901); HAYATA in Journ. Coll. Sci. Tokyo XX-3, 32. et Tab. II, fig. J.(1904); NAKAI in Journ. Coll. Sci. Tokyo XXXI, 182.(1911); MATSUMURA, Ind. Pl. Jap. II-2, 301.(1912); C. K. SCHNEIDER, Handb. Laubholzk. II, 136. Fig. 86, k-r. 87, f. (1912); SHIRASAWA, Icon. Sylva Essenc. Forest. Jap. II, Tab. 36.(1908); K. ROSENTHAL in ENGLER, Pfl.-reich 68 Heft IV, 147. a. 9.(1919); et in ENGLER, Pfl.-fam. rev. ed. 19. c. 235. (1931) cum fig.

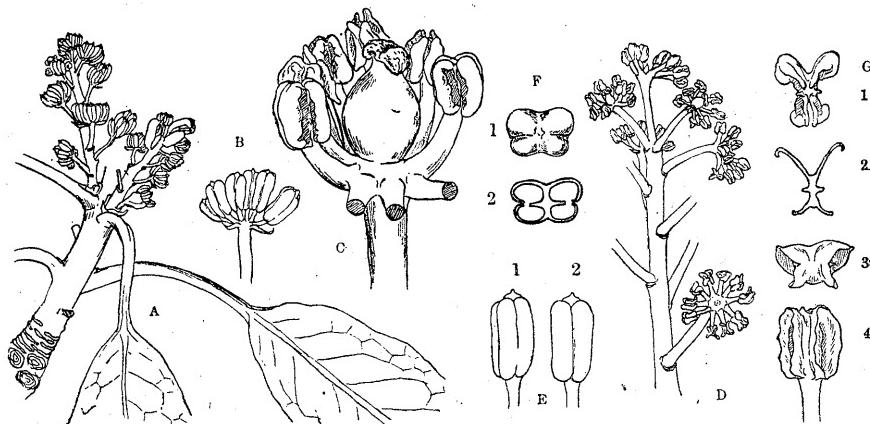


Fig. 1. *Daphniphyllum macropodum*.

Ovarii rudimentum in flore masculino evolutum.

- A Ramulus cum inflorescentiis masculinis axillaribus.
- B Flos masculinus sepalis vulgo 2 squamiformibus caducissimis praeditus.
- C Flos pseudohermaphroditus; rudimentum ovarii in centro staminarum insertum, staminis 3 amortis. (valde auct.)
- D Inflorescentia masculina floribus pseudohermaphroditis intermixta.
- E Stamina, 1) laterale. 2) exteriore visa.
- F Idem, 1) desuper visum. 2) eins sectio horizontalis.
- G Eadem iam dehiscentia, 1)2)3) supra. 4) interiore visum. 2) sectio horizontalis.

var. **typicum** HURUSAWA, nom. nov.

D. macropodum MIQUEL l. c. et auctores supra citati.

D. glaucescens (non BLUME) FRANCHET et SAVATIER, Enum. Pl. Jap. II, 488. n. 1534. (1879).

. *Daphniphyllum*, sp. Fr. et Sav. l. c. n. 1535. a. [uti *D. macropodum* Fr. et Sav. (an Miq. ?)]

Specim. examin.: Honsyū, prov. Kii, Yugawa. (J. MATSUMURA, Jul. 25. 1883.), ibidem, Nisimuro-gun, Hutakawa-mura. (TOZO NAKASIMA, Aug. 25. 1932.)—hoc specimen fructescentiam multicarpam cum rachidibus gracilibus portat.; prov. Suwō, Yosiki-gun, Miyano-mura. (J. NIKAI, no. 327. Jul. 2. 1882.)

Kyūshū, ins. Tsushima. (T. NAKAI, Jul. 26. 1921.); ibidem, in monte Siratake. (K. HIRATA, Oct. 1. 1924.)

- A Flos trimerus.
 - 1) oblique supra visus.
 - 2) laterale visus, ovario cum staminodiis interdum rudimentis antherarum praeditis cincto.
 - 3) Ovarii sectio horizontalis.
 - 4) Idem paulum superiore.

- B Flos dimerus.
 - 1) 2) 3) 4) ut in praecedente.

- C Flos tetramerus.
 - 1) 2) 3) 4) ut in praec.

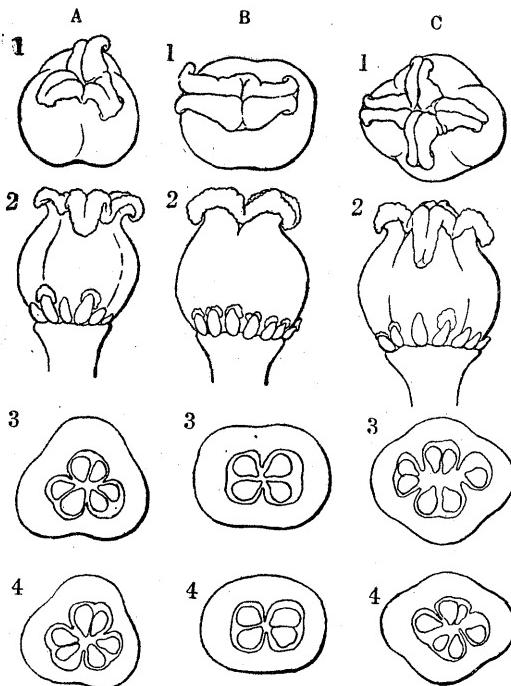


Fig. 2. Flores foeminei *Daphniphylli* *macropodi* Miq. var. *typici* HURUSAWA.

Corea, ins. Qualpaert, in monte Hallaisan. (U. FAURIE, Jun.. 1907.), ibidem, ad 1000 m. altit. (T. ISIDORYA, Aug. 16. 1912.), ibidem, in latere septentrionali.

(T. NAKAI, Mai. 10. et 19. 1913. et Oct. 30. 1917.), ibidem, in australi latere.
 (T. NAKAI, no. 6269. Nov. 1, 1917.)—specimina ex insula Quelpaert cum
 rachidibus crassiusculis et foliis apice plus minus acute mucronulatis limbis
 latioribus satis majoribus paulum a plantis hondoensibus discrepare videtur.;
 prov. Zennan, in monte Hakuyō-san. (T. NAKAI, Mai. 3. 1913.), Tintō-gun, ins.
 Settō. (T. NAKAI, Jun. 26. 1921), ibidem, Kainan-gun, Daitonzan, Taikōji-san.
 (T. NAKAI, Jul. 2. 1921.), ins. Ooryongtō, Ōbokudon. (T. NAKAI, no. 4387. Jun.
 3. 1917.), ibidem, Dōdon, in silva littorali. (T. ISIDÖYA, Mai. 26. 1916.)

var. **viridipes** NAKAI in Bot. Mag. Tokyo XXXVI, 63.(1922).

Petiolis in hieme viridiibus a var. typico distat, in siccando difficillime
 cognoscitur an foliis basi rotundatis, rachidibus crassioribus et staminodiis
 acutissimis patentibus distinguitur.

Specim. examin.: Honsyū, prov. Idu, in monte Amagisan. (T. NAKAI! ex
 Bot. Mag. Tokyo loc. cit.), ins. Hatijō. (M. OGATA, Sept. 9. 1921), ins. Miyake.
 (K. HAYASI, Mart. 12. 1940.), prov. Idumo, monte Daisen. (T. SAWADA, Jul.
 15. 1922.)

Kyūsyū, prov. Ōsumi, Utinomaki. (ipse, Apr. 17. 1939.), ins. Yakusima.
 (G. MASAMUNE, Jul. 28. 1927.)—plantam cum petiolis viridissimis quae in
 Kyūsyū australi crescit vero cum hac varietate hondoensi identicum esse dubito,
 flores sexu utrinque observare necesse habeo.

var. **Lhuysii** NAKAI in Journ. Arnold Arbor. V, 68.(1924).

Tetranthaeta Lhuysii CARRIÈRE in Rev. Hort. 368, f. 78 (1869).

Planta culta.

Foliis albo-aureo-variegatis distinguitur.

var. **crassifolium** HURUSAWA, var. nov.

Ramuli fusco-nitidusculi lenticellati, cortice in secco facile deciduo. Folia
 oblongo-ovata apice obtusiuscula minute mucronulata basi cuneata vel rotun-
 data subtus glauca, satis minora, sub fructu 6–8 cm longa circ. 3 cm lata valde
 crassa supra impresso nervosa, breviter petiolata, petiolis 1–2 cm longis cum
 costa foliorum vivide coccineis. Rachis infructescentiae crassus 2.5–3.5 cm
 longis, internodiis circ. 0.5 cm longis. Fructus cyaneo-niger glaucescens 1.0 cm
 longus 0.7 cm latus, pedicello circ. 0.5 cm longo.

Primo intuitu foliorum minorum D. Teijsmanni refert sed nervis non crebre anastomosantibus ut in hac specie facile ab ea distinguitur.

Specim. examin.: Corea, prov. Zennan, in monte Daiton-zan. (SABURO HUKUHARA, Dec. 3. 1922.), ibidem, in monte Tōrin-zan. (SABURO HUKUHARA, Dec. 3. 1922.).

var. **humile** (MAXIM.) ROSENTHAL in ENGLER, Pfl.-reich 68 Heft. IV, 147. a. 11. (1911).

D. humile MAXIMOWICZ (in litt.) ex FRANCHET et SAVATIER, Enum. Pl. Jap. II, 488. (1879); HAYATA in Journ. Coll. Sci. Tokyo XX-3, 34. (1904) pro "planta non satis nota"; MATSUMURA, Ind. Pl. Jap. II-2, 301. (1912); K. SCHNEIDER, Laubholzk. II, 136. (1912).

Daphniphyllum, sp. (*D. humilis affinis*) FRANCHET et SAVATIER⁽¹⁾ loc. cit. II, 488. n. 1533. c. (1879).

Frutex truncis in planta montana quam 1 m. humilioribus deorsum subrepens sed in planta pratensi vel submontana saepius 1-3 m altus erectus, ramis et ramulis lenticellatis lutescentibus quam in *D. macropodo* sensu stricto plus minus gracilioribus. Folia subtus glauca interdum satis albescentia, nervis quam typicum sparse anastomosantibus vulgo costae secundariae paucae sparsiores, etiam in pagina adulta non rigide chartacea vel coriacea ut in vars. praecedentibus sed submenbranaceo-chartacea, caetera ex majore parte illis similia, an modo mucronulo acuto in apice ab illis dignoscitur? (fide FRANCHET et SAVATIER loc. cit.) sed interdum hic character haud constans esse videtur. Limbus vulgo in ramulis

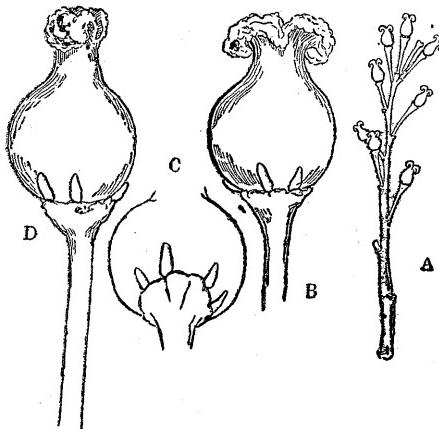


Fig. 3. *Daphniphyllum Dacropodium* var. *humile* (MAXIM.) ROSENTH.
A. Inflorescentia foeminea. B. Flos foeminen. C. Idem infra visus. D. Idem laterali visus.

¹⁾ Haec forma "statura elatiore et mucrone foliorum nec acutissimo" an transitum ad var. typicum sistit.

fertilibus 10–13 cm longus 4–5.5 cm latus raro ad 19 cm longus 7 cm latus. Fl. foeminei: ovaris staminodiis nonnullis cito deciduis cinctis, caeruleo-pallidis. Fructus oblongo-ovatus apice obtusus nitidus, stigmatibus brevibus persistentibus, rhachidibus 5–6 cm longis cum pedicellis magis gracilibus saepe filiforme elongatis 10 cm longis. Fl. masculi mihi ignoti.

Planta in Tokyo allata quam spontanea in Honshū septentrionali altius evadet. (fide K. HISAUTI).

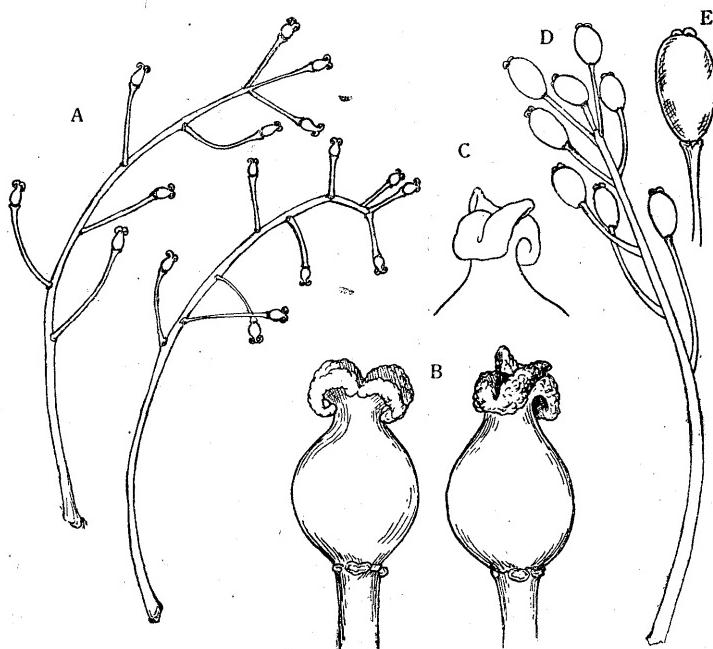
Specim. examin.: Hokkaido, prov. Otaru, Takasima. (J. MATSUMURA, Aug. 5. 1899.); prov. Osima, Hakodate. (J. VEITCH, Sept. 2. 1892.); prov. Osima, Yosioka. (K. MRYABE et Y. TOKUBUTI, Jul. 18. 1890.).

Honshū, prov. Uzen, in monte Haguro, Gwassan. (F. MAEKAWA et H. HARA, Jun. 12. 1937.); prov. Mutu, in monte Hakkōda. (S. HATTORI, Jul. 30. 1926.), ibidem, prope lacum Towada. (ipse, Jul. 18. 1939.); prov. Iwasiro, in monte Iimori (J. MATSUMURA, Aug. 13. 1819.); prov. Ettyū, in monte Iwate. (M. HONDA, Jul. 26. 1927.), ibidem, circa montem Hayatigamine. (M. HONDA, Jul. 1927.); prov. Iwasiro, Aizu, in monte Bandai-san. (S. HATTORI, Jul. 3. 1925.), ibidem, Osenuma. (G. NAKAHARA, Jul. 30. 1903.); ibidem, Ozegahara, Sanjyō-notaki. (I. HURUSAWA, 5. Juli. 1941.)—Floribus faemineis distincte cum staminodiis praeditis; prov. Kaga, in monte Hakusan. (J. MATSUMURA, Aug. 8. 1881.); prov. Kōzuke, Minakami. (K. HISAUTI, Jun. 4. 1933.); prov. Mino, circa montem Enasan. (M. MIYOSHI, Nov. 1919.); prov. Sinano, in monte Togakusi. (J. MATSUMURA, Jul. 26. 1884.); prov. Hida, Sirakawamura, Managodani. (K. HISAUTI, Jul. 28. 1940, specimen fructigerum rhachidibus gracilibus.).

Daphniphyllum membranaceum HAYATA, Icon. Pl. Form. VI, 41. (1916).

Ex descriptione Hayatana, "fl. foem.: perianthii segmenta interdum complete ad nullum reducta vel interdum brevissima glandulaeformia 7–8 apice peltato-truncata $\frac{1}{4}$ mm longa totiusque lata distincta." Haec segmenta glandulaeformia, ut in specimine videtur (specimen typicum visum), haud calycis segmenta (sepala) sensu Daphniphylli Teijsmanni etc. sed staminodiorum rudimenta essent. Calyx sensu vero in hac specie utraque sexu destitutus.

Specimina examinata: Formosa, mt. Rankanzan. (B. HAYATA, 12. Mai. 1916.—Typus in Herb. Tokyo Imp. Univ.)—folia tenuissimo membranacea magna ad 19 cm longa circ. 6 cm lata supra nitiduscula subtus opaca fuscentia; costae secundariae plus minus 16 minute flexuosa, venis quam in *D. macropodo*, densius sed quam in *D. Teijsmanni* sparsius anastomosantibus. Fig. 4 inflorescentia et flores foeminei ex hoc specimine deliniavi.: Formosa,

Fig. 4. *Daphniphyllum membranaceum* HAYATA.

A. Inflorescentia foem. B. 1, 2, Flores foeminei. C. Stigma.
D. Infrutescentia. E. Fructus.

mt. Tentyōzan. (MATUDA, 4. Aug. 1919.)—folia rigidius chartacea elliptica vel oblonga circ. 14 cm longa 4.5 cm lata apice obtusa cuspidata basi cuneato-obtusa supra nitidusecula subtus opaca, venis inter costas secundarias plus minus 14- jugis minute flexuosas densius anastomosantibus utrinque prominentibus, petiolis 2-3 cm longis supra canaliculatis. Influentescentia circ. 10 em longa, rachidibus quam petiolis gracilioribus, pedicelis gracillimis 1.5-2.5 cm longis, fructibus laxis ellipsoideis vel interdum vix oblique oblongis plus minus 10 mm (in ciccis) longis 6-8 mm latis facie asperato-rugosis, stigmatibus 2 persistentibus dilatatis linguiformibus, quisque interdum bifidis, calycibus tota nullis. Ramulus gracilior lenticellatus.: ibid. mt. Niitakayama (Y. SATAKE, 27. Oct. 1940.)—specimen fructigerum, fructibus 8-11 in una rachide sitis pedicelis gracilibus 1.5-2.0 mm longis laxis, ellipsoideis ad oblongis utrinque obtusis basi vix acutiseculis cyaneo-glaucouscentibus, stigmatibus persistentibus recurvis. (Fig. 4. D.) Folia adulta non satis membranacea sed chartacea ambitu laminae et magnitudine cum specimine typico bene convenient.